U.S. Army Corps of Engineers

Action Memorandum
Volume II Engineering Evaluation/Cost Analysis
Former Honey Lake Demolition Range - Dry Lake Area
Sierra Army Depot
Lassen County, California

SEPTEMBER 2006

Contract No. DACA87-95-D-0017
Task Order No. 0022
Project No. CA-SIAD-01-SP

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DECLARATION

This Volume II Engineering Evaluation/Cost Analysis (EE/CA) Action Memorandum represents the selected munitions response actions for the Honey Lake Dry Lake Area that lies within the boundaries of the Former Honey Lake Demolition Range, Sierra Army Depot, Lassen County, California. The U.S. Army, which is the lead agency under the Defense Environmental Restoration Program at the Sierra Army Depot, has developed this Action Memorandum per the Comprehensive Environmental Response, Compensation and Liability Act, as amended, to be consistent with the National Contingency Plan. This decision document has been prepared based on the administrative records developed for the Dry Lake Area project site. This Action Memorandum describes the Non-Time Critical Removal Action (NTCRA) for the Dry Lake Area. The NTCRA includes: a Subsurface Removal of Munitions and Explosives of Concern (MEC) to 1 Foot over the Open Burn/Open Detonation (OB/OD) Sector; a Surface Removal of MEC over the Buffer Sector; Institutional Controls, which will also apply to the entire Dry Lake Area, for the Periphery Sector; and the implementation of 5-Year Reviews. The California Department of Toxic Substances Control and the California State Lands Commission concur with the munitions response actions the U.S. Army selected and have provided letters of concurrence. This document has been approved by the undersigned.

Approval:

Addison D. Davis, IV
Deputy Assistant Secretary of the Army
(Environment, Safety, and Occupational Health)

SEP 01 2006

ENGINEERING EVALUATION/COST ANALYSIS
ACTION MEMORANDUM

Dry Lake Area
Former Honey Lake Demolition Range
Sierra Army Depot
Lassen County, California

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1. INTRODUCTION

The U.S. Army Engineering and Support Center, Huntsville (CEHNC), and the U.S. Army Corps of Engineers (USACE), Sacramento District (CESPK), teamed to produce the Volume II Engineering Evaluation/Cost Analysis (EE/CA), Former Honey Lake Demolition Range - Dry Lake Area, Sierra Army Depot (SIAD), Lassen County, California (hereinafter referred to as the Dry Lake Area EE/CA) to evaluate and recommend the most appropriate munitions response to reduce the potential explosive hazards associated with the presence of munitions and explosives of concern (MEC). This Action Memorandum presents the munitions response actions identified in the Dry Lake Area EE/CA Report and that are selected for implementation at the Dry Lake Area.

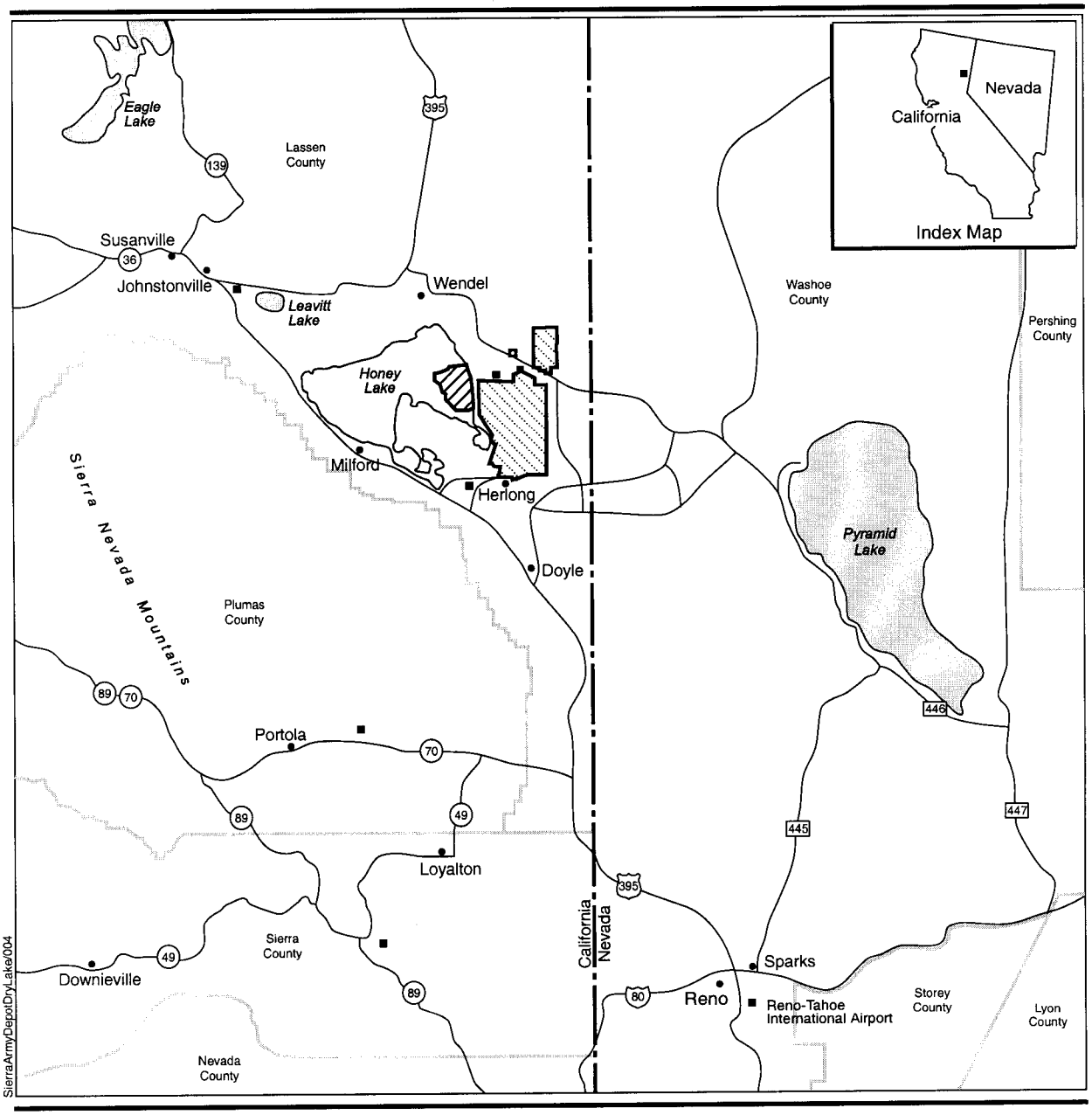
2. STATEMENT AND PURPOSE OF SCOPE

Site Description. The Dry Lake Area is 4,486 acres that is situated in the northwest region of SIAD's Former Honey Lake Demolition. The Dry Lake Area is northwest of the unincorporated community of Herlong in the Honey Lake area of Lassen County, California, approximately 40 miles southeast of Susanville, California, and 55 miles northwest of Reno, Nevada (Figure 1).

The Dry Lake Area munitions response site (MRS) lies approximately 3,900 feet above mean sea level in the Honey Lake Valley along the northeast flank of the Sierra Nevada Mountain Range. The Honey Lake Valley is in a topographically closed basin at the juncture of three geologic and physiographic provinces. To the north are the volcanic cones and flows of the Modoc Plateau, to the east is the Basin and Range Physiographic Province, and to the west and south lies the north edge of the Sierra Nevada Mountain Range. The topography of the Honey Lake Valley is relatively flat. The topographic relief that surrounds the Dry Lake Area MRS generally ranges from 1 to 3 feet south to north and approximately 1 to 10 feet west to east.

Honey Lake is a closed basin intermittent lake that is fed by two major tributaries, the Susan River to the north and Long Valley Creek to the south. The lake is also fed by other minor sources that enter the lake along its western shoreline. Because there are no natural outlets to Honey Lake, the water level is primarily regulated by precipitation within the watershed (e.g., the amount of snow in the surrounding mountain ranges), from irrigation run-off into the lake, and by evaporation from and the amount of water pumped from the lake to irrigate adjacent farmlands.

SIAD's History. In 1941, the Army selected the land east of Honey Lake as the site to establish the Sierra Ordnance Depot. Construction of the Depot began in 1942. In 1944, the parcel containing Honey Lake was transferred from the State of California to the Depot subject to a reversion clause. The Sierra Ordnance Depot was later renamed as the Sierra Army Depot (SIAD).



EXPLANATION

- County Boundary
- State Boundary
- Interstate Highway
- U.S. Highway
- California State Highway
- Nevada State Highway
- Sierra Army Depot Boundary
- Sierra Army Depot
- Dry Lake Area
- Honey Lake
- Airports

0 3 6 12 Miles

Regional Map

Figure 1

SIAD conducted open burning (OB) and open detonation (OD) of excess, unserviceable, and/or obsolete military munitions following World War II. The first documented OB/OD activity occurred in 1945 on the dry lakebed of Honey Lake. This OD activity consisted of 600, 105-millimeter (mm) antitank rounds. Another documented OD that consisted of M1 antitank mines occurred in 1946. SIAD used the lakebed for OD and OB into the 1950s. It is unclear when SIAD discontinued OB/OD demolition activities on the lakebed, although a 1954 newspaper article indicated that SIAD was conducting OB/OD at the site of the present OB/OD area. Historical records (including 16mm films) indicate that the Honey Lake Demolition Range was in use until 1951, and possibly into the late 1950s.

The U.S. Army transferred the majority of Honey Lake (the Primary Parcel) to the Center for Urban Watershed Renewal (CUWR) in 2003. CUWR has been supported by the Honey Lake Conservation Team (HLCT) in the management of the Primary Parcel. The present plan is to transfer the Primary Parcel back to the California State Lands Commission (SLC) in late Summer/early Fall 2006, and to transfer the Dry Lake Area to the SLC after all requirements for the SLC to accept the property have been met. Because of the potential explosives hazard present, the Dry Lake Area was leased to CUWR. It is the U.S. Army's intention to transfer the Dry Lake Area to the SLC after all administrative requirements for the SLC to accept the property have been met.

EE/CA Process. The scope of the Dry Lake Area EE/CA was limited to the evaluation of risk to human safety associated with the explosive and chemical hazards of MEC or munitions constituents (MC). (This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks means: (a) UXO, as defined in 10 USC 101(e)(5); (b) DMM, as defined in 10 USC 2710(e)(2); or (c) Munitions constituents (MC)(e.g., TNT, RDX), as defined in 10 USC 2710(e)(3), present in high enough concentrations to pose an explosive hazard.) The EE/CA Report documents the decision process to determine the most appropriate munitions response actions for the 4,486-acre Dry Lake Area.

This Action Memorandum presents the selected munitions response actions for the Dry Lake Area. The U.S. Army chose these actions per the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The basis for the U.S. Army's decision is documented in the Administrative Record for the Dry Lake Area. This record is available at the SIAD, Building 75. Copies of documents are available at the repositories at the Herlong Public Library; the Susanville Public Library; the Reno Public Library; and the California Department of Toxic Substances Control's (DTSC) Sacramento Office. The State of California concurs with the selected remedy.

3. PROJECT JUSTIFICATION

The data collected during the EE/CA field investigation was used to perform a qualitative risk evaluation for assessing the potential explosive safety risk to human health and the environment at the Dry Lake Area MRS. The results of the USACE's application of the CEHNC Ordnance and Explosives Risk Impact Assessment (OERIA) evaluation tool provide the basis for the qualitative risk analysis. Results of the evaluation concluded that the overall explosive safety risk for the OB/OD and Buffer Sectors is moderate and low for the Periphery Sector. The Dry Lake Area is considered to have military munitions that are regarded as sensitive. When encountered, such munitions may detonate if handled or disturbed causing serious injury or death. Soil sampling demonstrates that there is no chemical or explosive contamination of the soil that presents a hazard to human health or the environment.

White phosphorus rounds were recovered from three different grids within the OB/OD Sector. Similar DMM are almost certain to remain in these areas and may pose a risk to those accessing the Dry Lake Area. Although warning signs are in place around the perimeter of Dry Lake Area, the public has open access to the area. However, the Dry Lake Area is only accessible by unimproved dirt roads. There are no residential areas located near Dry Lake Area and there is nothing associated with the Dry Lake Area that would attract the public to that area.

4. RESPONSE ACTION ALTERNATIVES CONSIDERED

The Dry Lake Area EE/CA evaluated the effectiveness, implementability, and cost of seven munitions response actions alternatives.

Alternative 1 - No-Action Alternative. None of the other munitions response alternatives would occur under this alternative. The No Action Alternative, however, included a review of any new information about any explosive hazards associated with past U.S. Army activities at the Dry Lake Area as it becomes available. If MEC should be discovered in the future, the Army will reconsider the status of the property. The No Action Alternative is indicative of a determination that is open to further and future review of an area.

Alternative 2 - Institutional Controls. Institutional Controls protect property owners and the public from hazards present at a site by warning of the possible presence of MEC and/or limiting the access or use of a site. Institutional Controls include the use of engineering controls (e.g., fences), educational programs (e.g., informational pamphlets), and legal mechanisms (e.g., land use covenants). The overall effectiveness of Institutional Controls depends entirely on regulatory agencies and private landowner support, involvement, and willingness to enforce and maintain Institutional Controls implemented to eliminate public interaction with MEC.

Alternative 3 - Surface Removal of MEC. This munitions response action alternative includes the location and removal of MEC from the ground surface. Teams of UXO-qualified personnel would visually search a specified area and remove all MEC from the ground surface within that area.

Alternative 4 - Subsurface Removal of MEC to 1-Foot Utilizing the Best Appropriate Technology. This munitions response action alternative includes the subsurface detection (using geophysical instrumentation), excavation, and destruction or removal and destruction of all MEC within a specified area to a depth of one foot below ground surface (bgs).

Alternative 5 - Subsurface Removal of MEC to Depth Utilizing the Best Appropriate Technology. This munitions response action alternative includes the subsurface detection (using geophysical instrumentation), excavation, and destruction or removal and destruction of all MEC within a specified area regardless of depth.

Alternative 6 - Construction of a Soil Cap. This munitions response action alternative includes the construction of a soil cap, approximately two-feet thick, over the Dry Lake Area as a barrier between people who access the area and any remaining explosive hazard.

Alternative 7 - Army Retention. This munitions response action alternative consists of the U.S. Army retaining the Dry Lake Area. This alternative would include installing a fence and maintaining administrative controls (e.g., warning signs) around the perimeter of the area to prevent access to the Dry Lake Area and exposure to any remaining MEC.

See the Dry Lake Area EE/CA, Chapter 6, for a more detailed description of the above alternatives.

5. HIGHLIGHTS OF COMMUNITY PARTICIPATION

All public involvement requirements identified by the EE/CA process have been met. The U.S. Army coordinated all public/community relations support through CESPK. CESPK informed the local community by providing project status briefings and allowing open discussion of project-related activities for the Dry Lake Area EE/CA at quarterly Restoration Advisory Board (RAB) that were held at the SIAD. DTSC, which has also been provided project status updates, has been involved with evaluation of the munitions response action alternatives throughout the development of the Dry Lake Area EE/CA.

On 26 July 2006, The U.S. Army held a public meeting at the chapel in Herlong to present the findings of the Preliminary Final Dry Lake Area EE/CA Report to the public and to receive public and regulatory agency comments to the Dry Lake Area EE/CA Report and Action Memorandum. Prior to the meeting the public was notified that copies of the Preliminary Final Dry Lake Area EE/CA Report and Action Memorandum were available for review at a number of locations that

were established for the project. These repository locations include the SIAD, Building 75; the Herlong Public Library; the Susanville Public Library; the Reno Public Library; and the DTSC Sacramento Office. The repositories contain documents that were prepared in support of the EE/CA at the Dry Lake Area and are accessible to the public.

6. COORDINATION SUMMARY

Project activities for the Dry Lake Area EE/CA were coordinated with CEHNC, CESPK, the U.S. Army BRAC Division (BRACD), and a number of state and local agencies, such as DTSC, the SLC, the Lassen County Local Reuse Authority (LCLRA), CUWR, and the HLCT. Project Work Plans were reviewed by the aforementioned U.S. Army organizations as well as DTSC. The U.S. Army also met with DTSC, the SLC, and the HLCT several times during the development of the Dry Lake Area EE/CA. Project documents were made available to project stakeholders and public via the Administrative Record.

Key Contacts for state officials include:

- California Department of Toxic Substances Control (DTSC), Mr. Charlie Ridenour (Chief of Federal Facilities Unit, Office of Military Facilities),
- California State Lands Commission (SLC), Mr. Dave Plummer, Regional Manager.

Key Contacts for the Lease Holder:

- Center for Urban Watershed Renewal (CUWR), Mr. Paul Sutton, Executive Director.
- CUWR, Mr. Bill Jordan, Operations Director.

7. SELECTION CRITERIA

Each of the seven munitions response action alternatives was evaluated against the following criteria. These criteria are discussed in greater detail in The Dry Lake Area EE/CA Report, Section 6.3. The evaluation of each of these criteria can be found in Section 6.5. The selection criteria used to evaluate the munitions response action alternatives include:

Effectiveness. Effectiveness is a measure of a munitions response action's ability to reduce the potential for exposure to or interaction with MEC. Effectiveness takes into account the overall protection of human safety, compliance with applicable or relevant and appropriate requirements (ARARs), both long- and short-term effectiveness, and hazard reduction.

Implementability. Implementability is a measure of whether a munitions response action can be physically and administratively conducted. Implementability takes into account technical and administrative feasibility, availability of services and materials, and both regulatory agency and public acceptance.

Cost. Cost is simply the estimated investment cost of each munitions response action alternative.

8. DESCRIPTION OF SELECTED REMEDY

The results of the EE/CA indicate that there is a potential public safety risk associated with MEC, specifically DMM, known or suspected to be present at Dry Lake Area. The munitions response actions selected for each sector of the Dry Lake Area are were based upon the following information:

- A Time Critical Removal Action (TCRA) was performed in 2003 to eliminate or reduce the potential danger to public safety from DMM on the surface of the Dry Lake Area. An additional surface removal may be required in the future because MEC may become exposed due to wind and water erosion of the lakebed surface.

- Results of the EE/CA field investigation and interpretation of the airborne magnetic data suggest there are numerous subsurface pits filled with ferrous metal (most likely DMM and/or munitions debris [MD]) within the OB/OD Sector. However, the EE/CA investigation found that the demolition pits were well below the surface of the lakebed and soil conditions would make it very difficult to access these pits.

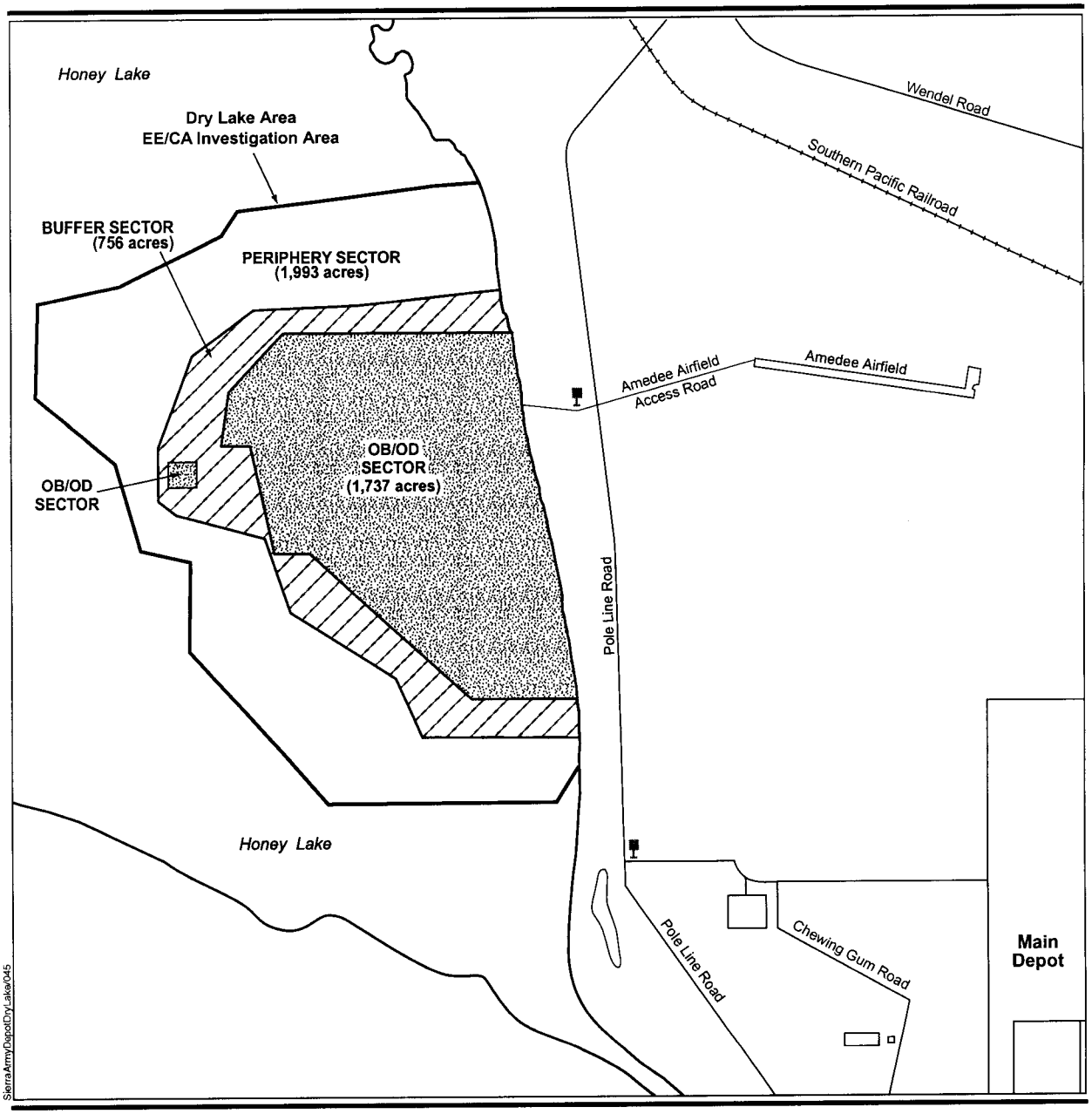
- OERIA determined that there is a moderate to low explosive safety risk level at the Dry Lake Area because, although MEC may be present within the Dry Lake Area, the site, although remote, is still accessible to the general public.

- Lake intermittently fills with water resulting in wet or muddy conditions that impede or deny public access to any potential MEC that may remain on site.

Figure 2 shows the munitions response actions that will be implemented for each sector at the Dry Lake Area. The below provides a description of these response actions.

8.1.

OB/OD Sector. The EE/CA field investigation recovered 138 DMM from the surface and subsurface, to a depth of 72-inches bgs, within the OB/OD Sector. To reduce the potential for a public encounter with MEC, Alternative 4, a subsurface removal of MEC to one foot, using the best appropriate removal technology, will be conducted over the 1,737 acres of the OB/OD Sector (see Figure 2). This munitions response is based on:



EXPLANATION

- Dry Lake EE/CA Investigation Area (4,486 acres)
- Surface Clearance of DMM (756 acres)
- Subsurface Clearance of DMM to 1-foot (1,737 acres)
- Proposed Display Case Location
- DMM Discarded Military Munitions
- EE/CA Engineering Evaluation/Cost Analysis
- OB/OD Open Burn/Open Detonation

0 .25 .5 1 Mile

Note: (1) Institutional Controls including display cases, community awareness meetings, information brochures and land use/ zoning restrictions.
(2) Warning signs are already in place around the Dry Lake Area.

Recommended Munitions Response Actions

Figure 2

A subsurface removal of MEC to one foot includes a surface removal (Alternative 3) followed by excavation and removal of all detected subsurface MEC up to a depth of one foot bgs. This response removes detectable explosive hazards and provides effective risk reduction for areas subject to both surface and limited intrusive activities (e.g., recreational activities).

The various geophysical detection technologies would be tested, prior to use, to help select the most appropriate technology that best meet the munitions response objectives. UXO-qualified personnel would investigate detected subsurface anomalies to a depth of one foot by to identify the source. If heavy concentrations of metallic debris are encountered, soil sifting technologies may be used. Sifting technologies include both dig and haul techniques and use of technologies or procedures that perform digging and sifting as a single process.

MEC recovered from the OB/OD Sector will be detonated in place or, if UXO-qualified personnel determine that the risk of movement is acceptable, moved to a DDESB-approved location for consolidation. All disposition actions will be coordinated with appropriate the state regulatory agencies and performed per the DDESB-approved explosives safety submission and approved plans (e.g., Dry Lake Area Response Action Work Plan).

Dust suppression measures (e.g., application of water to ground surface prior to excavation) will be employed throughout the response (removal) process and will be discussed in detail in the Dry Lake Area Response Action Work Plan.

Under California law, blow-in-place (open detonation) procedures constitute the treatment of hazardous waste and require either a California Hazardous Waste Treatment Permit, or a Remedial Action Plan approved by the DTSC. On-site response actions carried out as part of CERCLA do not require a formal permit, but must meet the substantive provisions of such a permit. This document and the associated Dry Lake Area Response Action Work Plan (to be developed) provide documentation that all substantive requirements of California law related to the detonation of MEC have been addressed. Munitions debris and other material (e.g., range-related debris) that are determined not to present an explosive hazard will be handled as scrap metal and will be recycled by an authorized recycler. If residual munitions constituents, which are explosives (e.g., RDX, HMX) residues that present an explosive hazard, are found to be present on such material, it will be placed in secured storage and transported to an approved, off-site disposal facility.

A subsurface removal of MEC to one foot over the OB/OD Sector will not allow unlimited intrusive activities to be conducted in the removal area because current detection technology is not considered to be 100 percent effective. Intrusive activities that require excavations below the MEC removal depth in known MEC areas should be evaluated and, if necessary, performed only in conjunction with construction support.

The implementation of this alternative (Alternative 4)--subsurface removal of MEC to one foot--will incorporate those Institutional Controls (Alternative 2) necessary to restrict the use or access to the Dry Lake Area, limiting exposure to any residual explosive hazards remaining in the OB/OD Sector.

The implementation of this alternative by specially trained personnel and the use of appropriate technology will remove MEC that individuals who access the Dry Lake Area could easily encounter. The implementation of this alternative would provide a substantial level of protection for public health and the environment. Although a TCRA was conducted over this area in 2003, implementing this alternative would remove any MEC that may have been exposed by natural phenomena (e.g., wind and water erosion) since the completion of the TCRA, plus add an extra level of risk reduction by removing all detected MEC to one foot bgs. Additionally, the Dry Lake Area, which is part of Honey Lake, is an intermittent lake, and there have been no changes in land use identified for this area. The DDESB will be requested to review and approve this response alternative.

The estimated cost for implementation of this alternative over the OB/OD Sector is $13,388,453 (Table 1). Estimated cost data for this munitions response action is detailed in Appendix H of the EE/CA Report.

8.2. **Buffer Sector.** Only two DMM were recovered at four- and six-inches bgs. In addition, munitions debris (124 pieces) was recovered from the Buffer Sector during the Dry Lake Area EE/CA investigation. Therefore, Alternative 3, a surface removal of MEC, is recommended over the 756 acre Buffer Sector (see Figure 2).

A surface removal of MEC involves locating and removing MEC from the ground surface. Teams of UXO-qualified personnel use visual identification to search for and remove surface MEC. The surface removal will be conducted by establishing a system of grids within which a series of sweep lanes will be placed. These lanes are typically 5 feet in width or narrower and are installed to ensure that all MEC and munitions- or range-related debris is systematically removed from each grid.

When UXO-qualified personnel determine that the risk of movement of MEC discovered during the surface sweep is not acceptable, the MEC will be detonated in place. If the risk of movement is determined acceptable, the MEC will be move to an on-site area that meets the requirements of DoD 6055.9-STD approved by the DDESB for destruction of recovered MEC. All disposition actions will be coordinated with appropriate the state regulatory agencies and performed per the DDESB-approved explosives safety submission and approved plans (e.g., Dry Lake Area Response Action Work Plan).

As discussed above, this Action memorandum and the Dry Lake Area Response Action Work Plan (to be developed at a later date) will provide documentation of compliance with DoD 6055.9-STD and that all substantive requirements of California law have been met. MD recovered during the surface removal that UXO-qualified personnel document as safe (i.e., as not presenting an explosives hazard) will be turned-in to the nearest Defense Reutilization Marketing Office (DRMO) or sold (provided) to an authorized scrap metal recycler.

Table 1. Estimated Costs for Recommended Munitions Response Actions

Sector/Area	Total Acreage	Total MEC[a] (UXO, DMM, and MC)	Total MD (tons)[a]	Recommendations	Estimated Cost
Dry Lake Area				Institutional Controls[d], including display cases, community awareness briefings, landowner notification, development of informational pamphlets, and land use covenant.	**$176,105**
				5-Year Reviews (total of 4 reviews).	**$409,924**
OB/OD Sector	1,737	138 DMM	10.0	Subsurface Removal of MEC to one foot.	**$13,388,453**(e)
Buffer Sector	756	2 DMM	0.5	Surface Removal of MEC.	**$1,032,025**[f]
Periphery Sector	1,993	105 DMM[b]	<0.5	Institutional Controls (see above)[d].	**$ --**[g]
Total	**4,486**	**245**(c)	**11.0**(c)		**$15,006,507**

Notes:
(a) Results of EE/CA field investigation conducted by Earth Tech in 2003.
(b) These DMM items were believed to be a one-time abandonment of 40mm rounds and not indicative of standard ordnance demilitarization practices at the Former Honey Lake Demolition Range.
(c) An additional 53,212 DMM items and over 250 tons of MD was recovered and removed during the TRCA conducted in 2003.
(d) Bilingual warning signs were installed at the Former Honey Lake Demolition Range in fall 2003.
(e) Costs are based on the utilization of a mechanized MEC removal system over 75 percent of the area.
(f) Surface removal will be conducted concurrently with the Removal of MEC to one foot for the OB/OD Sector, therefore, one time costs (e.g., Work Plan) are included as part of the response action costs for the OB/OD Sector.
(g) Implementation of the recommended Institutional Controls will serve the entire Former Honey Lake Demolition Range and costs have been provided above.

< = less than
DMM = discarded military munitions
EE/CA = Engineering Evaluation/Cost Analysis
MC = munitions constituents
MD = munitions debris
MEC = munitions and explosives of concern
OB/OD = open burn/open detonation
UXO = unexploded ordnance

The implementation of this alternative by specially trained personnel and the use of appropriate technology will remove MEC that individuals who access the Dry Lake Area could easily encounter. The implementation of this alternative would provide a substantial level of protection for public health and the environment.

Although a TCRA was conducted over this area in 2003, implementing this alternative would remove any MEC that may have been exposed by natural phenomena since the completion of the TCRA. Additionally, the Dry Lake Area, which is part of Honey Lake, is an intermittent lake, and there have been no changes in land use identified for this area.

The implementation of a Surface Removal of MEC will incorporate all appropriate Institutional Controls (Alternative 2) necessary to restrict use or access and limit exposure to hazards remaining in the Buffer Sector.

The estimated cost for implementation of this alternative over the Buffer Sector is $1,032,025 (Table 1). Estimated cost data for this munitions response action is detailed in Appendix H of the Dry Lake Area EE/CA Report.

8.3. **Periphery Sector.** The Dry Lake Area Periphery Sector is considered to present a low MEC hazard because MEC was found on the surface and the general public can access the area. A total 105 DMM and MD (9 pieces) were recovered on the surface of this sector. The DMM, which were all recovered from the surface at a single location were all 40 millimeter (mm) projectiles. Given data from both the Dry Lake Area EE/CA and TCRA, the discovery of this number of munitions at a single location was determined to be an anomaly, given the OD procedures that SIAD used. Because only limited MEC was discovered in this sector and given the site-specific data available, the conduct of additional removal actions is not warranted. However, given the potential for public access, institutional controls are recommended to help ensure public safety (see Figure 2).

Institutional controls to be put into place for the Periphery Sector are identified below. These institutional controls will also apply to all sectors of the Dry Lake Area.

- Installation of two bilingual (English and Spanish) educational display cases at access points to the Dry Lake Area,
- Development and distribution of informational pamphlets to local residence and for use at each of the display cases,
- Community awareness briefings at RAB meetings,
- Notification of local landowners,
- Implementation of LUC.

The cost for implementation of institutional controls is $176,105 (see Table 1, above). (Estimated cost data for this munitions response action is detailed in Appendix H of the Dry Lake Area EE/CA Report, while more detailed descriptions of Institutional Controls are provided below.)

8.4. **Objectives of Institutional Controls.** Institutional controls, to include Land Use Controls (LUC), that will apply to the entire Dry Lake Area (see Figure 2), are considered necessary because of the subsurface MEC that will remain after completion of planned response actions. Institutional Controls complement the planned response actions to be taken and help prevent public encounters with MEC.

This Action Memorandum contains specific language about the implementation, monitoring, reporting and enforcement of institutional controls. The Remedial Action Work Plan will provide details for the implementation of LUC. Therefore, compliance with the terms of this Action Memorandum will be protective of human health and the environment. Because the restrictions and the means for implementing the restrictions are specifically described in the following subsections, it is not necessary for the Army to submit any new, post-Action Memorandum Institutional Controls implementation documents, such as a LUC Implementation Plan, or new operation and maintenance plans.
The Institutional Controls Alternative (Alternative 2) includes an enforceable use restriction and institutional control on the use of the Dry Lake Area. The Army is responsible for implementing, maintaining and monitoring remedial actions, to include institutional controls, before property transfer. The property owner will be responsible for maintaining the institutional controls post transfer, unless otherwise noted. The Army will exercise this responsibility under CERCLA and the NCP.

The protection of human health and the environment shall be the primary and fundamental indicator of whether institutional controls are protective of human health and the environment. The Army believes successful implementation, operation, and maintenance of these controls will be protective of human health and the environment and comply with all applicable legal requirements.

The Army may contract third parties to perform any of the actions associated with institutional Controls for which it is responsible. However, the Army remains ultimately responsible under CERCLA and the NCP for their successful implementation and maintenance. Monitoring, maintenance and other controls, as established by this Action Memorandum and appropriate transfer documents will be maintained until these institutional controls are no longer necessary.

MEC is known or suspected to be present on the Dry Lake Area, which is currently leased to the CUWR (Lease in Furtherance of Conveyance). Under the lease terms, CUWR will manage the property, but is not allowed to access it without prior written approval and escort from the Army. The lease restrictions, which are in place and operational, will remain in place until the property is transferred by deed. At the time of deed transfer, lease restrictions will be superseded by restrictions to be included in the federal deed and the State Land Use Covenant as described in this Action Memorandum.

8.5. **Description of Institutional Controls.** The institutional controls to be implemented at the Dry Lake area will consist of the following measures:

8.5.1. **Installation of educational display cases.** Two bilingual (English and Spanish) educational display cases will be installed at designated access (entry) points to the Dry Lake Area.

These display cases will provide notice and information regarding the explosive hazards potentially present. The display cases will positioned at established entry points to give notice to people accessing the Dry Lake Area of land use restrictions and to help deter people from entering the area. Although these display cases do not provide a physical barrier for accessing the area, they provide information to the public about the nature of the potential explosive hazard present in portions of the Dry Lake Area where fencing may not be possible. The display cases will address:

- The reasons that a explosives safety hazard is known or suspected to exist.
- Procedures (e.g., not entering the area, staying on specified roads and trails from which MEC has been removed, not digging or disturbing the ground in areas where MEC is known or suspected to be present) to avoid an encounter with MEC.
- The Army's Explosives Safety Education Program (the 3Rs, Recognize, Retreat, Report) and website (www.denix.osd.mil/UXOSafety).
  - Recognize - The types of munitions either used or demilitarized within the Dry Lake Area (Visual schematics or photographs that will assist the public in recognizing potential MEC hazards.
  - Retreat - Do not touch, move or disturb any suspect MEC encountered, but leave carefully leave the area, in the same direction from which they entered.
  - Report - Notify local law enforcement (police, Park rangers, etc.).

8.5.2. **Development and Distribution of Informational Pamphlets.** Informational pamphlets that will be built around the Army's UXO Safety Education Program (3Rs) and provide users the Program's website will be developed and distribution to local residence and be available at each display case location (See above).

The Army will fund the initial distribution and development of educational materials. Long-term implementation would be the responsibility of landowners and local agencies.

8.5.3. **Community Awareness Briefings.** Community awareness briefings regarding the status/progress of the selected remedies for the Dry Lake Area will be conducted at quarterly Restoration Advisory Board (RAB) meetings held at SIAD.

Educating the local community is an extremely important part of any institutional control program. Generally, if people are aware of and understand the potential explosive hazards associated with the presence of MEC at a site, they will take

the necessary precautions to avoid an encounter and to take appropriate action should they encounter MEC. Education programs, which can be tailored to meet the specific needs of a particular audience (e.g., local homeowners, school children, regulators, and developers), can be conducted as often as necessary. Although educational programs constitute a viable stand-alone institutional control, they can be used to improve the effectiveness of other institutional controls and to compliment other munitions response actions.

RAB meetings have been selected as the forum for educating the local community about the potential explosive hazards at the Dry Lake Area. A RAB is an advisory body that is formed to act as a focal point for the exchange of information between an installation, in this case SIAD, and the local community regarding environmental restoration activities. A RAB is intended to bring together community members who reflect the diverse interests within the local community, enabling the early continued two-way flow of information, concerns, values, and needs between the affected community and the installation. RAB members meet regularly (e.g., quarterly) to review and comment on technical documents and plans related to ongoing environmental studies and restoration activities. Members are expected to serve as liaisons with the community and to be available to meet with community members and groups, as necessary. All RAB meetings are open to the public. Additionally, SIAD's technical support staff will be available to provide informational support and explanation to RAB members and the public.

8.5.4. **Notification of Local Landowners.** The Army will contact local landowners who own or occupy land that is adjacent to the Dry Lake Area by mail. This notification will advise addressees of:

- The results of the Dry Lake Area EE/CA
- Response actions, to include a description of and a schedule for each response to be conducted the Dry Lake Area.
- A Point-of-contact and contact information (i.e., telephone number, and e-mail address or mailing address) should they have question or concerns about the response actions to be taken.

8.5.5. **Five-Year Reviews.** All MRS at which a munitions response has been completed are required to implement periodic reviews (5-Year Reviews).

CERCLA 121 (c) requires the review of completed response actions no less than every 5 years to assure that human health and the environment are being protected.

The NCP states that if a response action is selected that results in contaminants remaining at the site, the lead agency (i.e., the Army) will review such action no less than every 5 years.

A series of 5-Year Reviews will be conducted at the Dry Lake Area to determine whether the munitions response selected continue to remain protective of human health, safety, and the environment. These 5-Year Reviews will also provide an opportunity to assess the applicability of new technology for addressing previous technical impracticability determinations that may have been present throughout the EE/CA process.

The scope of the 5-Year Review will be specific to the Dry Lake Area and will depend upon the munitions response objectives and the specific response actions implemented. The reviews will evaluate appropriate site-specific factors that may affect the continued protectiveness of selected munitions response actions at the Dry Lake Area. These factors may include changes in physical conditions at the site, changes in public accessibility, approved changes in land use (see Approval of Land Use Modifications below), and the applicability of new technology for addressing a previous technical impracticability determination. The 5-Year Reviews will also evaluate the maintenance and enforcement of the Institutional Controls implemented as part of the selected remedy.

The 5-Year Review process for the Dry Lake Area will answer four general questions:

- Are the selected munitions response actions functioning as intended?
- Do the assumptions used at the time the munitions response actions were selected still valid?
- Does new information indicate that the selected munitions response actions is no longer protective of human health, safety, and the environment?
- Do Technical Infeasibility determinations made remain valid?

Data Quality Objectives (DQOs) will be developed throughout the 5-Year Review planning process, as described in Equipment Manual (EM) 200-1-2, Technical Project Planning (TPP) Process. These DQOs will help ensure that the required data is collected during all 5-Year Reviews and that this data is consistent with applicable 5-Year Review standards.

8.5.6. **Implementation of Land Use Controls (LUC).** Because it is not practicable to remove all MEC across the entire Dry Lake Area, LUCs will be a necessary component of the munitions response implemented. These controls will be designed to help prevent the public from inadvertently encountering MEC that could be exposed due by natural phenomena (e.g., erosion). The LUCs will apply to the whole Dry Lake Area (see Figure 2). The LUC performance objectives for the Dry Lake Area are described below. Specific, detailed LUC implementation actions will be identified in the Removal Action Workplan. Note: The State of California uses the term "Covenants Restricting the Use of Property" for LUCs.

LUCs Performance Objectives for the Dry Lake Area will help prevent:

- Construction on or excavation of the lakebed without prior regulatory approval.
- Residential use or development, including construction of hospitals, schools, day-care centers, and playgrounds.

8.5.6.1. **Land Use Controls.** Land Use Controls are physical, legal or administrative mechanisms that restrict the use of, or limit access to, contaminated or unsafe property to reduce risk to human health and the environment. Physical mechanisms, also called engineering controls, encompass a variety of engineered remedies to contain or reduce contamination and/or physical barriers to limit access to property such as fences or signs. LUCs are a subset of Institutional controls and are primarily legal mechanisms imposed to ensure the continued effectiveness of and integrity of the selected response action. LUCs also encompass other control measures such as administrative or governmental mechanisms such as permit programs, safety training, and zoning that help to restrict non-compatible activities, prevent exposure or educate the public as to the potential risks that may be posed at a site. The primary LUC performance objective for the Dry Lake Area is to attain the Remedial Action Objective of preventing the potential impact of an encounter with any MEC that may remain after the completion of the other munitions response actions proposed for the site. The proposed LUCs for the Dry Lake Area are intended to complement the planned remedial actions.

Specific language regarding the implementation, monitoring, reporting and enforcement of LUCs will be included in the Remedial Action Work Plan that will govern munitions response actions. However, generally speaking:

- The Army will be responsible for implementing, maintaining, and monitoring the remedial actions (including the LUCs) before property transfer.
- The transferee will be responsible for maintaining the LUCs after transfer unless otherwise noted.
- The Army will continue to ensure that the LUC performance objectives are being met by conducting five-year reviews per CERCLA and the NCP.

Although the Army may contractually arrange for third parties to perform any of the actions associated with LUCs, it is ultimately responsible under CERCLA for the successful implementation of LUCs, including the maintenance, monitoring and review of LUCs. Monitoring, maintenance and other controls as established in this Action Memorandum and the appropriate transfer documents will be continued until LUCs are no longer necessary.

The Dry Lake Area, which is known or suspected to contain MEC, is currently leased to the CUWR (Lease in Furtherance of Conveyance). Under the lease terms CUWR will manage the property, but is not allowed to access it without

prior written approval and escort from the Army. The lease restrictions are in place and operational and will remain in place until the property is transferred by deed. At the time of deed transfer, lease restrictions will be superseded by restrictions to be included in the federal deed and the State Land Use Covenant as described in this Action Memorandum.

8.5.6.2. **Deed Restriction and Reservation of Access.** The federal deeds for any property containing MEC will include a description of any residual MEC potentially present on the property, consistent with the Army's obligations under CERCLA Section 120(h). The specific restrictions set forth in this Action Memorandum and the implementing Work Plan. Institutional Controls, in the form of deed restrictions, are an "environmental restriction" under California Civil Code Section 1471. The deed will contain appropriate provisions to ensure that the restrictions continue to run with the land, as provided in California Civil Code Section 1471 and will include of legal description of the affected area.

The Army and regulatory agencies may conduct inspections of LUCs and the affected property. The deeds will also contain a reservation of access to the property for the Army and the State of California and their respective officials, agents, employees, contractors and subcontractors for purposes consistent with the Army Installation Restoration Program or the Federal Facilities Site Remediation Agreement. The Army will provide such access to regulatory agencies prior to transfer.

The environmental restriction is the basis for part of the CERCLA 120(h)(3) covenant that the United States is required to include in the deed for any property that has had hazardous substances stored for one year or more or known to have been released or disposed of on the property. During the time between adoption of this Action Memorandum and deeding the property, appropriate use restrictions for the property will be implemented as described in this Action Memorandum and the implementing Work Plan.

8.5.6.3. **Notice of Land Use Control.** The Army will (a) include the specific deed restriction language set forth in this Action Memorandum in the deed for the Dry Lake Area; and (b) provide a copy of the deed to the DTSC as soon as practicable after the transfer of fee title. The Army will provide information to the property owners regarding the necessary LUCs in the draft deed. The signed deed will also include the specific land use restriction as well as a condition that the transferee execute and record a State Land Use Covenant, within 10 days of transfer, to address any State obligations pursuant to State law, including 22 Code of California Regulations, Section 67391.1. The information will also be communicated to appropriate State and local agencies with authority regarding any of the activities or entities addressed in the controls to ensure that such agencies can factor the information into their oversight, approval, and decision-making activities.

Prior to conveyance of any Army property known or suspected to contain MEC, DTSC representatives will be given reasonable opportunity to review and comment on the applicable deed language and associated rights of entry for the DTSC for purposes of Institutional Controls oversight and enforcement.

The Army will also provide notification to Lassen County and local landowners in the vicinity of the Dry Lake Area that MEC will remain after the completion of the munitions response.

8.5.6.4. Evaluations/Monitoring. After property transfer, the owner will conduct monitoring, provide reports, and, as outlined in the remedial action work plan, undertake prompt action to address (a) any activity that is inconsistent with either the LUC Performance Objectives or use restrictions; or (b) any action that may interfere with LUC effectiveness. These evaluations will be provided to the DTSC. The monitoring reports will be used in preparation of Five-Year Reviews to evaluate the remedy's effectiveness.

The five-year reviews conducted by the Army will also address whether the Institutional Controls in the Action Memorandum were inserted in the deed and, if property was transferred during the period covered, whether the owners and State and local agencies were notified of the Institutional Controls affecting the property and whether use of the property has conformed to such Institutional Controls. Five-year review reports will make recommendations on the continuation, modification or elimination of annual reports and Institutional Controls monitoring frequencies. Five-year review reports will be submitted by the Army to the regulatory agencies for review and comment.

Although the Army is transferring procedural responsibilities to the transferee and its successors by provisions to be included in the deeds and may contractually arrange for third parties to perform any and all of the actions associated with the Institutional Controls, it is ultimately responsible for the remedy.

8.5.6.5. Response to Violations. After property transfer, if the transferee fails to satisfy its obligations pursuant to the State Land Use Covenant, DTSC may enforce such obligations against the transferee. If there is failure of the selected remedy or a violation of selected remedy obligations (for example, an activity inconsistent with Institutional Controls objectives or use restrictions, or any action that may interfere with the effectiveness of Institutional Controls), DTSC will notify the Army in writing of such failure as soon as practicable (but no longer than 14 days) upon discovery of the inconsistent activity or action that interferes with the effectiveness of the Institutional Controls, and initially seek corrective action or other recourse from the transferee. Within 21 days following DTSC's notification, the Parties (i.e., DTSC and landowner) shall confer to discuss re-establishing the selected remedy or implementing other necessary response actions to address the breach of the Institutional Controls. Once DTSC reports that the transferee is unwilling or unable to undertake the remedial actions, the Army will inform the other Parties, within 30 days, of measures it will take to address the breach.

8.5.6.6. Approval of Land Use Modification. The owner shall not modify or terminate land use controls or response actions that are part of the selected remedy without DTSC's and the Army's approval. The owner shall seek prior concurrence before any anticipated action that may disrupt the effectiveness of the land use control or any action that may alter or negate the need for land use controls.

Any grantee of property constrained by the Institutional Controls imposed through their transfer document(s) may request modification or termination of Institutional Controls. Modification or termination of Institutional Controls, except the State Land Use Covenant (discussed below), requires Army and DTSC approval.

8.5.6.7. **State Land Use Covenant Modification.** Any modification or termination of the State Land Use Covenant must be undertaken consistent with State law and will be the responsibility of the transferee or then-current owner or operator.

9. TRADE-OFF ANALYSIS

The response actions selected for the Dry Lake Area are sector specific and were developed to provide the most effective protection to the public from any remaining MEC hazards. The recommended response actions were based on numerous data, to include past, current, and reasonably anticipated future land use; the quantity and location of MEC and MD that the U.S. Army recovered during the EE/CA field investigation; and the data collected during previous investigations. The results of the OERIA process, a qualitative risk analysis tool, are presented in the Dry Lake Area EE/CA Report, Chapter 5. The selected response actions were also chosen on a detailed evaluation of the effectiveness, implementability (including regulatory agency and local community acceptance), and cost of each of the seven response alternatives, as presented in the Dry Lake Area EE/CA Report, Chapter 6. The Dry Lake Area EE/CA determined that the response action selected for each sector is the best alternative for that sector.

10. DOCUMENTATION OF SIGNIFICANT CHANGES

No significant changes to the proposed final response actions are anticipated. If the proposed response actions that this Action Memorandum outlines are delayed or are not implemented, the potential exists for continued endangerment to human health and the environment.

11. RESPONSIVENESS SUMMARY

Table 2 provides a summary of all public involvement activities associated with development of the Dry Lake Area EE/CA. No comments were received on the Dry Lake Area EE/CA or Action Memorandum from the public.

Table 2. Dry Lake Area Public Involvement

Activity	Date
RAB Meeting	9 April 2003)
RAB Meeting	16 July 2003
RAB Meeting	10 March 2004
RAB Meeting	12 May 2004
RAB Meeting	7 July 2004
RAB Meeting	22 September 2004
RAB Meeting	16 March 2005
RAB Meeting	11 May 2005
RAB Meeting	10 August 2005
RAB Meeting	16 November 2005
Public Review Meeting for EE/CA and Action Memorandum	26 July 2006

RAB (Restoration Advisory Board)